

**CCT470H5F LEC6001
Information Visualization (SH)
Course Outline - Fall 2011**

Class Location & Time	Thu, 06:00 PM - 09:00 PM SH J316
Instructor	Greg J. Smith
Office Location	-
Office Hours	By appointment
Telephone	-
E-mail Address	greg.smith1@sheridanc.on.ca
Course Web Site	http://cct470-f11.wikispaces.com

Course Description

The visualization of data is a powerful tool that increasingly impacts communication, marketing and strategic decision-making. This fourth-year seminar course builds on the design stream in CCIT and will investigate technologies and strategies for conceptualizing and representing information to various user groups. [24L]

Prerequisite: CCT305H5 or CCT360H5 (SSc)

Distribution Requirement: SSc

Only the Director of the CCIT program has the authority to give permission to waive course prerequisites. The UTM calendar states that students who lack the prerequisites for a course can be deregistered at any time.

Goals and Learning Objectives

CCT470 will present a broad overview of contemporary information design that allows students to become familiar with both theoretical issues and pragmatic realities.

Students will work to:

- develop their ability to critically engage information design while building the skill set to execute their own competent designs
- familiarize themselves with key precedents, practitioners, platforms and protocols within the field
- learn to handle and parse common data formats
- understand how space and time can be used to organize data
- conceptualize and execute an exhibition-calibre visualization project
- become familiar with the process of publically reviewing their design work

While CCT470 is not *explicitly* a computational design course, students will develop a rudimentary understanding of how to navigate this domain and-if they are self-motivated-have the opportunity to deliver a final project coded in a platform of their choosing.

Required Materials

Required:

Nathan Yau. *Visualize This: The FlowingData Guide to Design, Visualization and Statistics*. Wiley, 2011.

Additional required and reference readings will be linked to and distributed via the course wiki.

Highly recommended:

Jenn & Ken Visocky O' Grady. *The Information Design Handbook*. How, 2008.

Recommended:

Manuel Lima. *Visual Complexity: Mapping Patterns of Information*. Princeton Architectural Press, 2011.

Assessment and Grading Policies

Type	Description	Due Date	Weight
Assignment	21st century baseball card	2011-10-13	15%
Assignment	Case study	2011-11-03	15%
Assignment	Data visualization	2011-12-01	35%
Presentations	Tools and techniques: seminar presentation	On-going	10%
Lab	Lab reports	On-going	20%
Class Participation	Wiki/course participation	On-going	5%
Total			100%

Requirements and Criteria

21st century baseball card: This assignment will challenge students to use archival baseball cards and player data to develop a 'baseball card for the 21st century'. Students are free to realize this design via any means they choose, provided their final design meets size/formatting specifications. This work will be printed, pinned-up and presented in a design review to allow students to critically engage the work of their peers.

Case study: Each student will be responsible for selecting a visualization project of their choosing and writing a three page critical analysis of the work. These reports will be evaluated on writing style and depth of analysis and shared with the group on the course wiki.

Tools and techniques - seminar presentation (Oct. 13-27): Students will work alone or in pairs to prepare brief presentations on a visualization platform or protocol of their choosing. These presentations will help inform student tool/platform selections for the final project and allow the class to get a grasp of the wealth of options available for information designers. These findings will be handed in and shared on the wiki.

Data visualization: Students will alone or in pairs and work to find a dataset of their choosing and produce an involved visualization to be presented in the final class of the semester. While we will be working with Processing and R in class, this assignment is 'platform agnostic' and students may choose or cultivate any workflow of their choosing to produce this final project. It is imperative that students choose data/a topic that they are personally invested in so that they bring this energy to their information design.

Lab Reports: It is expected that students will work through all chapters of the *Visualize This* text listed in the syllabus. To ensure vigilance, each student will be required to hand in two short lab reports outlining their reaction to lab exercises as well as images and code examples that demonstrate further experimentation with this reference material. These reports must be handed in within one week of when the related material is covered in class.

Class/wiki participation: All students will receive a participation mark that reflects how engaged they were in class, lab and

on the course wiki.

Teaching Methods

CCT470 will expose students to an ambitious blend of critical scholarship on data visualization, pragmatic information design 'best practices' and rudimentary computational statistical design with R. Students will be expected to take ownership over assignments and labs and 'make them their own' as working in visualization requires extensive legwork, research and experimentation. Each class will begin with a short topical lecture, feature an extended analysis of a related case study and 1/3-1/2 of the class will be dedicated to lab sessions. Where possible, guest information designers/digital artists will give presentations on their work and the second half of the semester will feature student presentations on emerging visualization tools and platforms. All design work will culminate in internal reviews where students are expected to describe/justify their work and critically engage the work of their peers. Finally, the course wiki will be a central hub for discussion and knowledge exchange and it is crucial that students are dialed into this resource.

Procedures and Rules

E-Culture Policy

Only student Utmail accounts should be used for course communication and all emails from students must include the course code in the subject line and should be signed with the full student name and student number.

The most important asset to CCT470 is the communal wikispaces work space. Students will be expected to check this resource several times a week and (in addition to linking to/hosting related readings) it will foster conversation and regularly link out to relevant platforms and projects. **All technical questions should be posted on the wiki rather than emailed to the instructor as answers to these queries are a valuable public resource.** Email should only be used for questions about marks and administration. Email will typically be answered within 24 hours of receipt.

Learning Technology

All assignments will be handed in in class, email submissions will not be accepted.

Late Assignments, Extensions

You are expected to complete assignments on time. There will be a penalty for lateness of 10% deducted per day and work that is not handed in one week after the due date will not be accepted.

If you require more time to complete term work you should contact your instructor immediately, and no later than the due date. Original supporting documentation (e.g. U of T medical certificate, accident report) and a request for *Special Consideration Form* are to be brought to Rose Antonio, Academic Advisor in CC3018 no later than one week after the due date. Your documentation must specify exactly the length of the period during which you were unable to carry out your academic work. Students must adhere to UTM policy and declare their absence on ROSI, in order to receive academic accommodation for any course work.

Academic Integrity

From the Code of Behaviour on Academic Matters:

"It shall be an offence for a student knowingly:

(d) to represent as one's own any idea or expression of an idea or work of another in any academic examination or term test or in connection with any other form of academic work, i.e. to commit plagiarism. Wherever in the Code an offence is described as depending on "knowing", the offence shall likewise be deemed to have been committed if the person ought reasonably to have known."

From the U of T Mississauga Academic Calendar:

Honesty and fairness are considered fundamental to the University's mission, and, as a result, all those who violate those principles are dealt with as if they were damaging the integrity of the University itself. The University of Toronto treats academic offences very seriously. Students should note that copying, plagiarizing, or other forms of academic misconduct will not be tolerated. Any student caught engaging in such activities will be subject to academic discipline ranging from a mark of zero on the assignment, test or examination to dismissal from the University as outlined in the UTM calendar. Any

student abetting or otherwise assisting in such misconduct will also be subject to academic penalties.

Students are assumed to be informed about plagiarism and are expected to read the handout, How Not to Plagiarize (<http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize>) written by Margaret Procter. It is a valuable and succinct source of information on the topic. You are also supposed to be familiar, and considered as being familiar, with the *Code of Behaviour on Academic Matters* (see UTM Calendar: Codes and Policies or <http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) and *Code of Student Conduct* (<http://www.governingcouncil.utoronto.ca/policies/studentc.htm>), which spell out your rights, your duties and provide all the details on grading regulations and academic offences at the University of Toronto.

Expectations for Conduct in the Academic Setting

Students agree that by taking this course, they agree to adhere to the "ICCIT Expectations for Conduct in the Academic Setting." See link for the Code: <http://www.utm.utoronto.ca/iccit-code-of-conduct>

Religious Observance

Information about the University's Policy on Scheduling of Classes and Examinations and Other Accommodations for Religious Observances is at <http://www.vicereprovoststudents.utoronto.ca/publicationsandpolicies/guidelines/religiousobservances.htm>

Other Resources

AccessAbility

The University accommodates students with disabilities who have registered with the AccessAbility Resource Centre. Please let me know in advance, preferable in the first week of class, if you will require any accommodation on these grounds. To schedule a registration appointment with a disability advisor, please call the centre at 905-569-4699 or e-mail at:

access.utm@utoronto.ca.

<http://www.utm.utoronto.ca/access/>

Robert Gillespie Academic Skills Centre

Students can visit the Academic Skills Centre to consult with one of its strategists about understanding learning style, developing study plans for upcoming tests/exams, or discussing papers. Special Diagnostic Assessments are also offered and are designed to help you learn exactly where you stand with respect to critical academic skills.

<http://www.utm.utoronto.ca/asc>

UTM Library (Hazel McCallion Academic Learning Centre)

The University of Toronto boasts the biggest academic library in Canada and the second biggest in North America. Various services are available to students at the UTM Library and across the U of T library system. Services including borrowing, interlibrary loans, online references, laptop loans and the RBC Learning Commons. For more information, visit

<http://library.utm.utoronto.ca>.

Course Schedule

Date	Topic
2011-09-08	<p>Introduction to information visualization</p> <p><i>What is information visualization and what is at stake?</i></p> <p>Required reading: Paola Antonelli - "States of Design 01: Visualization" in <i>Domus</i></p> <p>Recommended Reading: <i>The Information Design Handbook: A need for Information Design, Information Design Defined</i> (Ch. 1&2)</p>
2011-09-15	<p>A brief history of visualization</p> <p><i>How does information visualization extend out of traditional graphic design and visual communication?</i></p> <p>Required reading: Edward Tufte "Graphical Practice" from <i>The Visual Display of Quantitative Information</i> (pg. 13-51) Stephen Wolfram - "Advance of the Data Civilization: A Timeline" <i>Visualize This: Telling Stories With Data</i> (Ch. 1)</p> <p>Recommended Reading: <i>The Information Design Handbook: ID History</i> (Ch. 3)</p> <p>Case Study: <i>The Minard Map</i></p>
2011-09-22	<p>Handling data</p> <p><i>What is data? What are the protocols and common formats we will encounter in working with it?</i></p> <p>Required reading: David Levy - "Meditation on a Receipt" from <i>Scrolling Forward: Making Sense of Documents in a Digital Age</i> (pg. 7-20) Alan Liu - "Transcendental Data: Toward a Cultural History and Aesthetics of the New Encoded Discourse" from <i>Local Transcendence</i> (pg 209-236) <i>Visualize This: Handling Data</i> (Ch. 2)</p> <p>Recommended Reading: <i>The Information Design Handbook: Communication Principles for ID</i> (Ch. 5)</p> <p>Case Study: <i>Gapminder</i></p> <p>Lab: Building a rudimentary data scraper (<i>Visualize This</i> Ch. 2)</p>

2011-09-29	<p>Tools & techniques</p> <p><i>What are popular tools for visualization? How do you choose the right tool/platform for the job?</i></p> <p>Required reading: "The encyclopaedic fragmentation of knowledge as theatre" (Hannah Hurtzig interview) in <i>Designing Universal Knowledge</i> (pg. 128-133) <i>Visualize This: Choosing Tools to Visualize Data</i> (Ch. 3)</p> <p>Recommended Reading: <i>The Information Design Handbook: Aesthetic Principles for ID</i> (Ch. 6)</p> <p>Lab: Visualization tool survey I</p>
2011-10-06	<p>Timelines</p> <p><i>What are some common approaches to representing time in information design?</i></p> <p>Required reading: "The surge of simplicity in a complex world" (Markus Frenzi interview) in <i>Designing Universal Knowledge</i> (pg. 221-228) <i>Visualize This: Visualizing Patterns over Time</i> (Ch. 4)</p> <p>Case Study: <i>Feltron Annual Report</i> Lab: Basic graphing in R (<i>Visualize This</i> Ch. 4)</p>
2011-10-13	<p>Visualizing networks</p> <p><i>How do we create coherent maps of networks?</i></p> <p>Design pin-up: 21st century baseball card</p> <p>Required reading: Manuel Lima - "Decoding Networks" in <i>Visual Complexity: Mapping Patterns of Information</i> (pg. 72-95) <i>Visualize This: Visualizing Relationships</i> (Ch. 6)</p> <p>Recommended Reading: <i>The Information Design Handbook: Case Studies: Understand</i> (Ch. 9)</p> <p>Case Study: <i>Cascade</i> Seminars: Student presentations Lab: Intermediate graphing in R (<i>Visualize This</i> Ch. 6)</p>
2011-10-20	<p>Performative data</p> <p><i>How might we move 'beyond the screen' and use data to drive creative expression?</i></p> <p>Required reading: Mitchell Whitelaw - "Art Against Information: Case Studies in Data Practice" in <i>Fibreiculture</i> <i>Visualize This: Spotting Differences</i> (Ch. 7)</p> <p>Case Study: <i>Stock Market Skirt</i> Seminars: Student presentations Lab: Heat maps, star charts & parallel coordinate plots (<i>Visualize This</i> Ch. 7)</p>

2011-10-27	<p>Spatial Relationships</p> <p><i>Where does visualizaiton stop and cartography begin? How do we map events and relationships spatially?</i></p> <p>Required reading: Mark Monmonier - "Maps for Political Propaganda" in <i>How to Lie with Maps</i> (pg. 87-112) Jeremy Crampton - "What is Critical Cartography and GIS?" in <i>Mapping</i> (pg. 39-48) <i>Visualize This: Visualizing Spatial Relationships</i> (Ch. 8)</p> <p>Recommended Reading: <i>The Information Design Handbook: Case Studies: Locate</i> (Ch. 7) Ken Garland - <i>Mr. Beck's Underground Map</i> (pg. 7-49)</p> <p>Case Study: <i>Million Dollar Blocks, OpenStreetMap 101</i> Seminars: Student presentations Lab: Plotting points, lines and regions (<i>Visualize This</i> Ch. 8)</p>
2011-11-03	<p>Design - best practices</p> <p><i>What constitutes good information design?</i></p> <p>Case study due</p> <p>Required reading: Sara Diamond "Lenticular Galaxies: The Polyvalent Aesthetics of Data Visualization" in <i>CTheory</i> Alan Liu - "Information is Style" from <i>The Laws of Cool</i> (pg. 195-230) <i>Visualize This: Designing with a Purpose</i> (Ch. 9)</p> <p>Case Study: <i>On the Origin of Species: The Preservation of Favoured Traces</i> Lab: Visualization tool survey II</p>
2011-11-10	<p>Big data/open data</p> <p><i>How are massive datasets changing scholarship? How might 'open' data change our habits and civic engagement?</i></p> <p>Required reading: Lev Manovich - "What is Visualization?" Fabien Girardin - "Data City: A Text for Visual Complexity, the book"</p> <p>Case Study: Cultural Analytics Lab: Processing I / Final project work session</p>
2011-11-17	<p>Data journalism, real time informatics</p> <p><i>What are the similarities between visualization and journalism?</i></p> <p>Required reading: Ian Bogost, Simon Ferrari & Bobby Schweizer - "Infographics" in <i>Newsgames</i> (pg. 35-60)</p> <p>Case Study: Selection of work from the New York Times Graphics Department Lab: Processing II / Final project work session</p>
2011-11-24	<p>Design Pin-up: Data visualization (final projects)</p> <p><i>The group will pin up/project final assignments and critique the body of work that has been produced.</i></p>

Last Date to drop course from Academic Record and GPA is October 31, 2011.

Every attempt will be made to follow this syllabus, but its content are subject to change, according to the rules as outlined in the UTM Instructor's Handbook, section 3.2.2.